National Semiconductor

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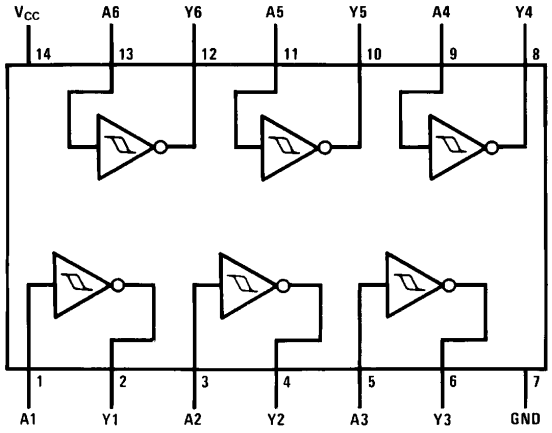
DM5414/DM7414 Hex Inverter with Schmitt Trigger Inputs

General Description

This device contains six independent gates each of which performs the logic INVERT function. Each input has hysteresis which increases the noise immunity and transforms a slowly changing input signal to a fast changing, jitter free output.

Connection Diagram

Dual-In-Line Package



TL/F/6503–1

Order Number DM5414J, DM5414W or DM7414N
See NS Package Number J14A, N14A or W14B

Function Table

$$Y = \overline{A}$$

Input	Output
A	Y
L	H
H	L

H = High Logic Level

L = Low Logic Level

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Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	
DM54	−55°C to +125°C
DM74	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

Note: *The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.*

Recommended Operating Conditions

Symbol	Parameter	DM5414			DM7414			Units
		Min	Nom	Max	Min	Nom	Max	
V_{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V_{T+}	Positive-Going Input Threshold Voltage (Note 1)	1.5	1.7	2	1.5	1.7	2	V
V_{T-}	Negative-Going Input Threshold Voltage (Note 1)	0.6	0.9	1.1	0.6	0.9	1.1	V
HYS	Input Hysteresis (Note 1)	0.4	0.8		0.4	0.8		V
I_{OH}	High Level Output Current			−0.8			−0.8	mA
I_{OL}	Low Level Output Current			16			16	mA
T_A	Free Air Operating Temperature	−55		125	0		70	°C

Electrical Characteristics

over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ (Note 2)	Max	Units
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −12 mA				−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max V_I = V_{T-}Min		2.4	3.4		V
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max V_I = V_{T+}Max			0.2	0.4	V
I_{T+}	Input Current at Positive-Going Threshold	V_{CC} = 5V, V_I = V_{T+}			−0.43		mA
I_{T-}	Input Current at Negative-Going Threshold	V_{CC} = 5V, V_I = V_{T-}			−0.56		mA
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 5.5V				1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.4V				40	μA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V				−1.2	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 3)	DM54	−18		−55	mA
			DM74	−18		−55	
I_{CCH}	Supply Current with Outputs High	V_{CC} = Max			22	36	mA
I_{CCL}	Supply Current with Outputs Low	V_{CC} = Max			39	60	mA

Note 1: V_{CC} = 5V

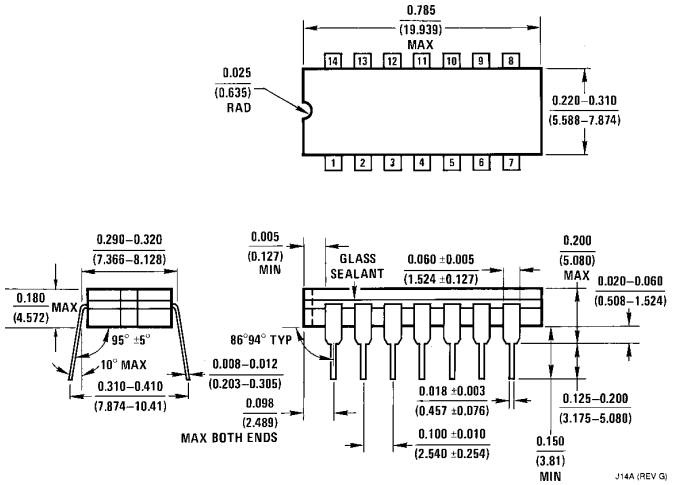
Note 2: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 3: Not more than one output should be shorted at a time.

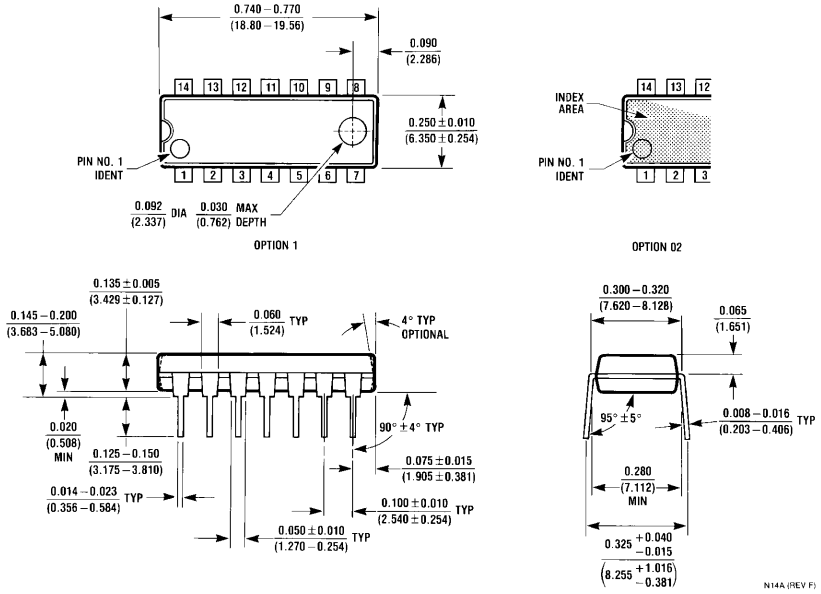
Switching Characteristics at $V_{CC} = 5V$ and $T_A = 25°C$ (See Section 1 for Test Waveforms and Output Load)

Symbol	Parameter	Conditions	Min	Max	Units
t_{PLH}	Propagation Delay Time Low to High Level Output	$C_L = 15$ pF $R_L = 400\Omega$		22	ns
t_{PHL}	Propagation Delay Time High to Low Level Output			22	ns

Physical Dimensions inches (millimeters)

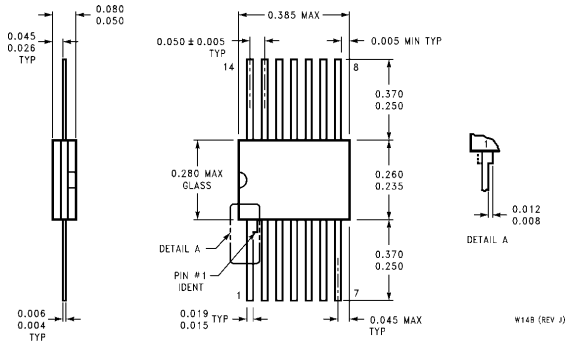


14-Lead Ceramic Dual-In-Line Package (J)
Order Number DM5414J
NS Package Number J14A



14-Lead Molded Dual-In-Line Package (N)
Order Number DM7414N
NS Package Number N14A

Physical Dimensions inches (millimeters) (Continued)



14-Lead Ceramic Flat Package (W)
Order Number DM5414W
NS Package Number W14B

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